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| APPLICATION NO.         | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
| 10/817,212              | 04/02/2004  | Steven R. Kleiman    | 112056-0126D1       | 2407             |
| 24267                   | 7590        | 10/29/2010           |                     |                  |
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| EXAMINER                |             |                      |                     |                  |
| NGUYEN, THAN VINH       |             |                      |                     |                  |
| ART UNIT                |             | PAPER NUMBER         |                     |                  |
| 2187                    |             |                      |                     |                  |
| MAIL DATE               |             | DELIVERY MODE        |                     |                  |
| 10/29/2010              |             | PAPER                |                     |                  |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/817,212

**Applicant(s)**

KLEIMAN ET AL.

**Examiner**

Than Nguyen

**Art Unit**

2187

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 October 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16, 39, 40 and 45-51 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-16, 39, 40, 45, 46 and 51 is/are allowed.
- 6) ☒ Claim(s) 47-50 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB006)  
Paper No(s)/Mail Date 10/7/10
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ ~~Notes of Informal Patent Application~~
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(c), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(c) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/7/10 has been entered.
2. Claims 1-16,39,40,45-51 are pending.
3. The IDS, filed 10/7/10, has been considered.

***Response to Amendment/Arguments***

4. All previous rejection(s)/objection(s) not listed below are withdrawn.
5. The claims amendment fixes most of the previous 112 problems. However, the amendment also introduces new 112 problems. The Examiner has listed the problems below and also proposed claim languages to correct and clarify the claim language. Applicant should adopt the proposed language as the proposed language does not further restrict the scope of the claims while further clarify the claimed invention. The proposed claim language (especially claims 47-49) should be accepted entirely or antecedent problems will persist.

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 47 recites the limitation "which method requires a fewer number of read operations" in line 11. There is insufficient antecedent basis for this limitation in the claim.

Applicant has not established precedence for determining which method requires a fewer number of read operations. In fact, there is no earlier mention of "method" at all. Thus, the term "which method requires a fewer number of reads" is inappropriate. The Examiner suggest Applicant uses an alternative language to better describe the invention:

**"determining, in response to the block layout information, whether a method to minimize a number of read blocks or a method to maximize chain lengths of read blocks requires a fewer number of read operations, and".**

8. Claim 47 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The language **"implementing a selection, during** the writing of the data to the plurality of storage devices, **responsive to** the block layout information, and **responsive to** whether minimizing the number of read blocks or substantially maximizing chain lengths of read blocks requires the fewer number of read operations" is vague and indefinite. It is unclear as what is selected. From the current claim language, a selection is made with the conditions "during..." and "responsive to...". However, it is not clear as **from what** a selection is made. The Examiner suggests using the following language:

**"wherein, during the writing of the data to the plurality of storage devices, responsive to the block layout information, and responsive to the determining step, selecting the method that requires the fewer number of read operations."**

9. Claim 48 recites the limitation "in response to **selecting to minimize the number of read blocks**" in line 2. There is insufficient antecedent basis for this limitation in the claim. There is no earlier step to select to minimize the number of read blocks, only the selection of a

method that resulted in a fewer number of read operations. The Examiner suggest using the following language:

**“48. The method of claim 47, further comprising:**

**in response to selecting the method that requires the fewer number of read operations, determining whether a subtraction method or a recalculation method requires a fewer number of read operations to calculate parity, and**

**performing the write operation and calculating the parity using the determined parity calculation method that requires the fewer number of read operations.”**

10. Claim 49 recites the limitation "in response to selecting to maximize chain length" in line 2. There is insufficient antecedent basis for this limitation in the claim. There is no antecedent basis for selecting to maximize chain length, only the determination of whether maximize chain length results in a fewer read operations. The Examiner suggests the following claim language:

**“49. The method of claim 47, further comprising:**

**in response the selection of the method to maximize chain lengths of read blocks, deciding which storage blocks to read to maximize chain lengths while minimizing the number of storage blocks read to support either the subtraction method or the recalculation method; and**

**performing the write operation and calculating the parity using the determined parity calculation method that requires the fewer number of read operations.”**

11. Claim 50 recites the limitation "which method requires a fewer number of read operations" in line 23. There is insufficient antecedent basis for this limitation in the claim.

Applicant has not established precedence for determining which method requires a fewer number

of read operations. Thus, the term “which method requires a fewer number of reads” is inappropriate. Furthermore, the language “using which method” (line 26) is vague since the term “which” does not further clarify the methods referred. The Examiner suggest Applicant uses an alternative language to better describe the invention:

**“50. A method for managing storage of data by a server, comprising:**

receiving a request to write data to a plurality of storage devices;

generating block layout information to determine which blocks within a plurality of blocks located in the plurality of storage devices are allocated and which are unallocated;

identifying blocks within the plurality of blocks for use by a set of I/O operations to store the data;

**testing to either maximize chain lengths of read operations for calculation of parity, or to place the data with a high degree of locality in the plurality of storage devices, the testing comprising:**

**determining, for both maximizing chain length and placing the data with the high degree of locality, a number of read operations needed to calculate parity for the data, by calculating parity using both a subtraction method of calculating parity and a recalculation method of calculating parity;**

**first choosing to either maximize chain lengths of read operations for calculation of parity or to place the data with the high degree of locality in the plurality of storage devices, and after the first choice, secondly choosing either the subtraction method of calculating parity or the recalculation method of calculating parity by determining which of these methods requires a fewest number of read operations,**

**choosing, from the subtraction method and recalculation method, the method which requires the fewest number of read operations for calculating parity of the data; and writing the data to the identified blocks, and calculating parity for the data using the chosen method.”**

***Allowable Subject Matter***

12. Claims 1-16,39-40,45,46,51 are allowed for reasons indicated previously.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Than Nguyen whose telephone number is 571-272-4198. The examiner can normally be reached on 7am-3pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Ellis can be reached on (571) 272-4205. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Than Nguyen/

Than Nguyen

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Primary Examiner, Art Unit 2187

Primary Examiner  
Art Unit 2187